

## **APPENDIX H**

### **Wing Dike Geometrics**

The computations that follow below are based on the current version of Iowa DOT Standard Road Plan RL-3. Refer to this standard plan for typical details of wing dikes. The variables listed below are shown on this standard plan. This standard plan is can be downloaded from the Iowa DOT Office of Design web site in Adobe Acrobat ([PDF](#)) or MicroStation ([DGN](#)) format.

1. To find “Location Station” for wing dike:

Location Station (“Long Dike”) =  $(Y + 38 \tan \theta) \pm$  station of center line of bearing

Location Station (“Short Dike”) =  $(38 \tan \theta - Y) \pm$  station of center line of bearing

2. To find length of wing dike:

$$\text{Length of “Long” wing dike} = \left[ \frac{\text{BridgeLength}^*}{2} - 38 \right] \times \left[ \frac{1}{\cos(\theta + 20)} \right]$$

$$\text{Length of “Short” wing dike } (\theta > 20 \text{ degrees}) = \left[ \frac{\text{BridgeLength}^*}{2} - 38 \right] \times \left[ \frac{1}{\cos(\theta - 20)} \right]$$

$$\text{Length of “Short wing dike } (\theta \leq 20 \text{ degrees}) = \left[ \frac{\text{BridgeLength}^*}{2} - 38 \right] \times \left[ \frac{1}{\cos(20 - \theta)} \right]$$

\* If bridge length is 150 feet or less, use 150 feet as the bridge length. If the bridge length is 250 feet or more, use 250 feet as the bridge length.

The table below computes the recommended lengths, for both short side and long side wing dikes as shown on the standard plan, for various bridge lengths and skew angles ( $\theta$ ).

Wing Dike Lengths (feet)

Bridge Length*	$\theta = 0^\circ$	$\theta = 15^\circ$		$\theta = 30^\circ$		$\theta = 45^\circ$	
	Equal	Long	Short	Long	Short	Long	Short
$\leq 150' - 0''$	39	45	37	58	38	88	41
151' - 4''	40	46	38	59	38	89	42
163' - 10''	47	54	44	68	45	104	48
176' - 4''	53	61	50	78	51	119	55
188' - 10''	60	69	57	88	57	134	62
201' - 4''	67	77	63	97	64	148	69
213' - 10''	73	84	69	107	70	163	76
226' - 4''	80	92	75	117	76	178	83
243' - 0''	89	102	84	130	85	198	92
$\geq 250' - 0''$	93	106	87	135	88	206	96

General Notes:

- Foreslopes of wing dike should be adjusted to meet local standards.
- Wing dikes are recommended any time that there is significant over bank flow at the crossing.
- If there is a problem with ROW etc., a shortened wing dike is better than no wing dike.